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Passalora acrocomiae sp. nov. and *Exosporium acrocomiae* from the palm *Acrocomia aculeata* in Puerto Rico

Eduardo Guatimosim, Henrique Jorge Pinto & Robert Weingart Barreto*

Departamento de Fitopatologia, Universidade Federal de Viçosa Viçosa, Minas Gerais, 36570-000, Brazil

*Correspondence to: *rbarreto@ufv.br*

Abstract — Collections determined by J.A. Stevenson as *Cercospora acrocomiae* [≡ *Exosporium acrocomiae*] from leaf spots of *Acrocomia media* [= *A. aculeata*] in Puerto Rico were re-examined. Two different fungi were identified: a previously unnoticed authentic cercosporoid taxon that we describe herein as *Passalora acrocomiae* and *Exosporium acrocomiae*, which we illustrate here for the first time and for which we designate a lectotype to substitute for the missing holotype.

Key words —*Arecaceae*, phytopathogens, reappraisal, taxonomic novelties

Introduction

Acrocomia aculeata (Jacq.) Lodd. ex Mart. (*Arecaceae*) is a thorny medium sized neotropical palm (Scariot & Lleras 1995). We present a reappraisal of the available specimens of a fungus collected on *A. media* [= *A. aculeata*] in Puerto Rico at the beginning of the 20th century. This dematiaceous fungus has been placed in two disparate genera, *Cercospora* and *Exosporium*. Firstly a description was given by Stevenson (1917) of the fungus as *Cercospora acrocomiae*. Chupp (1954) later described the same fungus, annotating it as "plainly an *Exosporium*." Accepting Chupp's opinion, Stevenson (1975) recombined the taxon as *Exosporium acrocomiae*. The original Stevenson and Chupp descriptions are very similar and fit best into the present concept of *Exosporium*. A re-examination of the original material was undertaken to confirm its placement in that genus.

Materials & methods

All relevant specimens were obtained as loans from BPI and CUP herbaria. Samples were examined under a dissecting microscope and freehand sections of fungal structures

or fungal structures scraped from colonized plant surfaces were mounted in lactic acid or lacto-fuchsin. Observations of fungal structures and measurements, as well as preparation of line drawings and photographs, were performed with an Olympus BX 51 light microscope fitted with a drawing tube and an Olympus E330 digital camera. Plates were organized with CorelDraw X5. Wherever possible, 30 measurements of structures from each fungus were made.

Taxonomy

Exosporium acrocomiae (J.A. Stev.) Chupp ex J.A. Stev., Contrib. Reed Herb. 23: 516, 1975. Plate 1

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≡ *Cercospora acrocomiae* J.A. Stev., Ann. Rep. Insular Exp. Stat. Porto Rico 1916–17: 89, 1917.

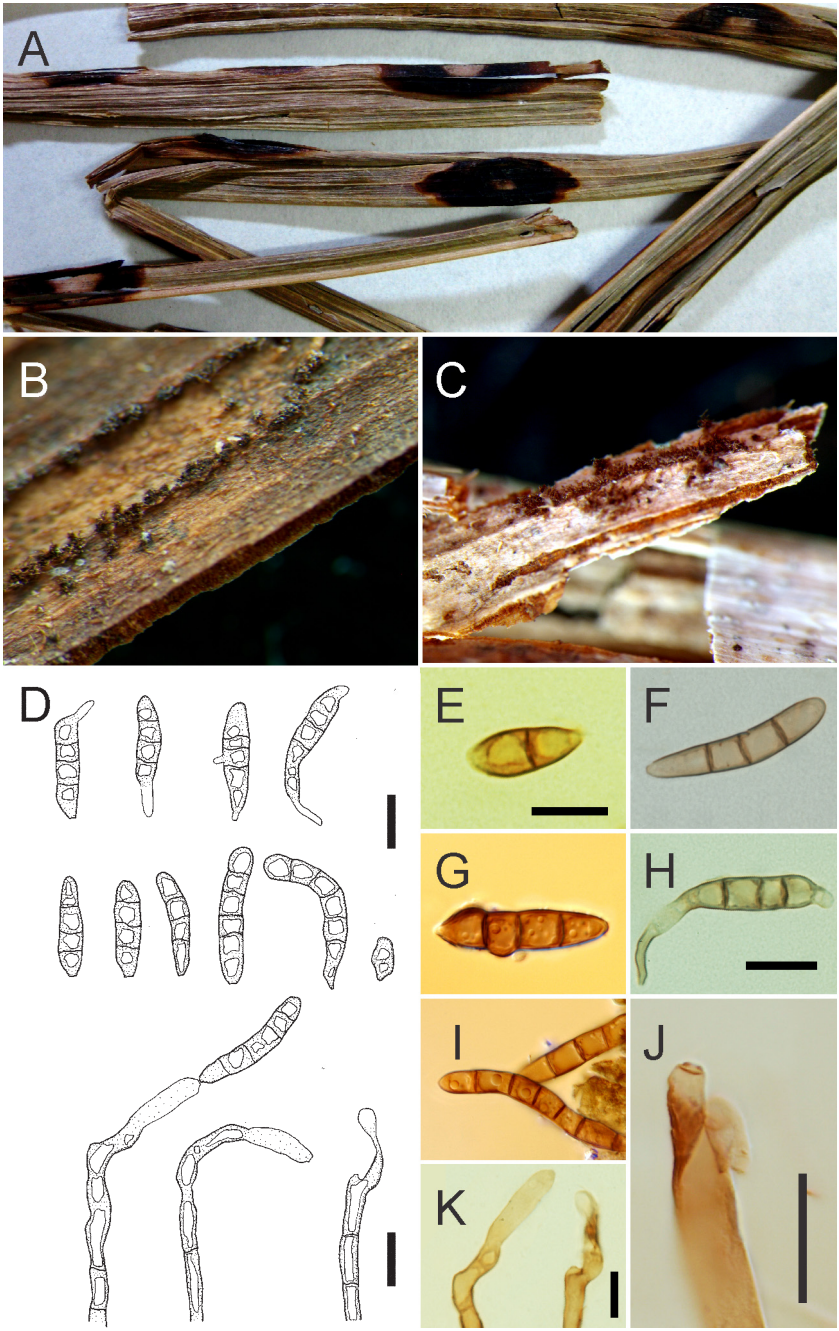
Original description (Stevenson 1917: 89–90): "Primary spots amphigenous, few, 1–8 per pinnæ: but areas between finally dying so as to make large continuous areas: regular, oval, with definite margins neither raised nor sunken, .8–1.5, rarely 2 cm. long by 3–6 mm. broad, rarely wider, at first red brown, then tricoloured, a central oval gray area (.5–3 mm. × 2–6 mm.), enclosed by a dark-brown band, 2–3 mm. wide, with an outer more or less irregular red-brown area, often no completely encircling the central portions. Conidal [sic] fascicles hypophyllous, numerous, confined to the central gray area, often in two distinct lines; conidiophores many to each fascicle, brown to olive brown, 1–2 septate, erect to reclining, concolorous with the conidia, 32–70 × 5–8 mu. Conidia 3–9 septate, long clavate, sometimes slightly curved, apical cell rounded, brown, often constricted at the septæ, 55–120 × 8–12 mu."

Supplementary description (Chupp 1954: 428): "Pinnae of older leaves are affected, so that part or the whole leaf may finally be killed, single spots 8–20 × 3–6 mm., or coalescing into large irregular areas, often with a central oval gray area enclosed by a dark brown band, with an outer irregular reddish brown area; fruiting chiefly hypophyllous; stromata dark to black, 40–100μ in diameter; fascicles very dense; conidiophores dark fuligeneous brown, septate, not geniculate, straight, curved, or tortuous, sometimes wider near the tip or irregular in width, not branched, spore scars absent or indistinct, 4–8 × 30–70μ; conidia dark fuligeneous brown, straight to slightly curved, clavato-cylindric to slightly attenuated toward the tip, obtuse ends, septa distinct, 3–9 in number, 5–10 (812) × 30–120 μ."

Type: PUERTO RICO, Rio Piedras, on leaves of *Acrocomia media* [= *A. aculeata*], July 1917, J.A. Stevenson 6604 (**Holotype**, not located, presumed lost); 14 Feb. 1912, J.R. Johnston [Stevenson 4206, 4206A] (Paratype = **Lectotype designated here**, BPI 432400; **isolectotypes**, BPI 432402, CUP 039018).

Lesions on leaves subcircular to elliptic, with pale brown edges and paler centre, 1.2–2.0 × 0.3–0.60 cm. Internal mycelium indistinct. External mycelium absent. Stroma sub-epidermal, subglobose, erumpent, composed of dark brown textura angularis, smooth. Conidiophores hypogenous, in dense fascicles (of up to 20 conidiophores per fascicle), sub-cylindrical, straight to slightly

Plate 1. *Exosporium acrocomiae*. A: Leaf spot symptoms on leaves; B–C: Hypogenous caespituli; D: Conidia and conidiophores; E–I: Conidia; J–K: Detail of conidiogenous loci. Bars: 20 μm.


A
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curved, occasionally geniculate at the apex, 40–70 × 4–5 µm, 3–5 (mainly 3)-septate, unbranched, thick-walled, pale brown to olivaceous-brown, smooth. Conidiogenous cells terminal, integrated, sub-cylindrical, 10–32 × 5–7 µm, pale brown, smooth. Conidiogenous loci almost inconspicuous, one per cell, 1.0–2.0 µm diam, thickened, not darkened. Conidia solitary, cylindrical, 30–100 × 5–10 µm, truncate at the base, apex rounded, 3–9-distoseptate, 2–3 µm diam at base, guttulate, pale brown to olivaceous-brown, smooth.

Additional Material Examined: **PUERTO RICO**, Rio Piedras, on *Acrocomia media*, 29 Jan. 1917, J.A. Stevenson 6175 (BPI 432399); 15 Jul. 1914, J.A. Stevenson No. 2090 (BPI 432397, 432398, 432401).

Passalora acrocomiae Guatimosim & R.W. Barreto, **sp. nov.** Plate 2

MycoBank MB801218

Differs from *Passalora eitenii* by its denser cespituli, stromata of textura intricata, smaller conidiophores, and absence of percurrently proliferating conidiogenous cells.

Type: Puerto Rico, Rio Piedras, on leaves of *Acrocomia media* [= *A. aculeata*], 15 Jul. 1914, J.A. Stevenson No. 2090 (**Holotype**, BPI 432397; **isotypes**, BPI 432398, 432401).

Etymology: from the host genus.

Lesions on leaves subcircular to elliptic, with pale brown edges and paler centre, 0.90–2.30 × 0.3–0.60 cm. Internal mycelium branched, 2.5 µm diam., septate, subhyaline. External mycelium absent. Stroma sub-epidermal, erumpent, subglobose, 100–157 × 87–113 µm, composed of dense textura intricata, pale brown, smooth. Conidiophores hypogenous, in dense fascicles (up to 20 conidiophores per fascicle), confined to the central gray area, often in two parallel distinct lines, sub-cylindrical, straight to slightly curved, 90–105 × 5–7 µm, 1–3-septate, unbranched, eguttulate, pale brown, smooth but with a distinctly roughened apex. Conidiogenous cells terminal, integrated, sub-cylindrical, 37–55 × 6–8 µm, pale brown, roughened. Conidiogenous loci conspicuous, one per cell, discoid, 1.5–4 µm diam. Conidia solitary, subcylindrical to slightly clavate, obconically truncate at the base, apex rounded, 35–68 × 8–13 µm, 1–3-septate, diam 2–4 µm at base, hila somewhat thickened and darkened-refractive, guttulate, pale brown to olivaceous-brown, mostly smooth but with a distinctly roughened apex.

Discussion

Based on examination of the holotype (Stevenson 6604) and other original collections, Chupp (1954) indicated that Stevenson's *Cercospora acrocomiae* was "plainly an *Exosporium,*" but did not publish a valid new combination. Stevenson (1975) accepted Chupp's opinion, and published the valid combination *Exosporium acrocomiae*. The genus *Exosporium* Link (type species, *E. tiliae* Link) is characterized by having typically darkened, thickened and prominent conidiogenous loci (scars) and conidial hila. After careful examination of the

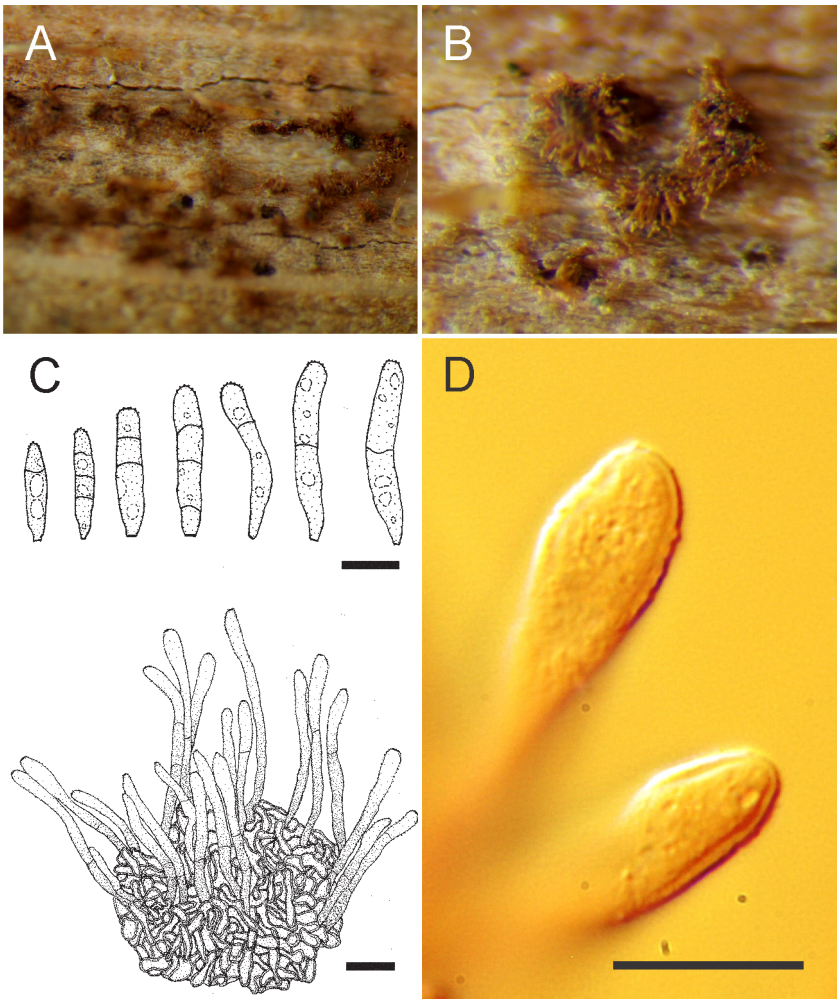

Plate 2. *Passalora acrocomiae.* A–B: Hypogenous caespituli; C–D: Conidia and conidiophores. Bars: 20 µm; E: Detail of the upper part of a conidiophore (note distinctly roughened apex). Bar: 5 µm.

original collections of *C. acrocomiae* (all from the same locality, including paratypes collected in 1912 and 1914 and an additional collection in 1917), we concluded that, in fact, two different fungi are present associated with the leaf spots on *A. aculeata* in Puerto Rico.

One is ubiquitous and is recognized as the fungus described by both authors, although neither Stevenson nor Chupp published illustrations of their fungus.

Although this fungus does not have the prominent, dark and thickened scars of many other *Exosporium* species, it still is adequately placed in *Exosporium*.

The second fungus associated with the *A. aculeata* leaf spots represents a novel species unnoticed by Stevenson and Chupp. This fungus is present only in three herbarium specimens from one Stevenson paratype collection, where it is much less common than *E. acrocomiae*. This new taxon bears the typical features of cercosporoid fungi now placed, under the current concept for this group, in *Passalora* (Crous & Braun 2003). Hence, the source of the confusion that emerged during the present study was the combined occurrence of two fungi on the same kind of lesions on one paratype collection of *C. acrocomiae.*

An additional complication is that, to the best of our knowledge, the holotype of *E. acrocomiae* is now lost; a search in all potential deposit sites for the holotype (BPI, CUP, ILL, ILS, UPRRP) failed to uncover this critical type specimen. Therefore, we chose one of the two paratypes (Stevenson 4206 = BPI 432400) as lectotype for *E. acrocomiae.*

It is interesting that a similar leaf spot was collected in Brazil during an ongoing study of the mycobiota of *A. aculeata* involving a third hyphomycete — also belonging to *Passalora* but clearly distinct from *P. acrocomiae* (pers. obs.). Probably this palm species reacts to attack by different pathogenic fungi by forming similar leaf spots.

Two *Exosporium* species have already been described on members of the *Arecaceae: Exosporium pulchellum* Sacc. on *Areca catechu* L. and *Orania palindan* (Blanco) Merr., both in the Philippines (Trotter 1931: 994–995; Teodoro 1937); *E. stilbaceum* (Moreau) M.B. Ellis on *Elaeis guineensis* Jacq. in Africa and Asia; and *Elaeis* sp. in Africa (Ellis 1971; Turner 1971; Pirozynski 1972; Liu 1977). These two species have much longer conidiophores (≤220 µm long) and thicker scars. Additionally *E. stilbaceum* forms conidia in chains and conidiophores arranged in synnemata (Ellis 1971).

There is only one *Passalora* described on the *Arecaceae*: *P. eitenii* R.B. Medeiros & Dianese on the Brazilian native palm *Syagrus comosa* (Mart.) Mart. *Passalora eitenii* differs morphologically *P. acrocomiae* by its sparser caespituli, stromata of textura angularis, larger conidiophores, and percurrently proliferating conidiogenous cells (Medeiros & Dianese 1994).

The search for a clarification of the status of *Exosporium* on *A. aculeata* resulted in confirming its identity in this genus and the unexpected discovery of an overlooked species of *Passalora.*

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